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Provincial Planning Board

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Report to the Provincial Planning Board
Upon the Application of the Town o 1
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REPORT TO THE
PROVINCIAL PLANNING BOARD
UPON THE APPLICATION OF
THE TOWN OF REDWATER
FOR NEW TOWN STATUS

AUGUST 1967

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THE APPLICATION

Imperial Oil Limited officially announced on April 5th, 1967, in a press release, that the Company will build a fertilizer manufacturing complex seven miles south of the Town of Redwater. Due to the magnitude of the development and its proximity to Redwater, the Town Council, after giving serious consideration to its present financial status and the necessary expansion of utilities to accommodate the increase in population resulting from the proposed industrial complex, held a Council meeting on May 9th, 1967. A motion was passed to apply for New Town status, pursuant to the provisions of "The New Towns Act", being Chapter 39 of the Statutes of Alberta, 1956, as amended. The request was transmitted in letters dated May 11th and 17th, 1967, to the Minister of Municipal Affairs and in turn was directed to the Provincial Planning Board for consideration.

Section 4(3) of the Act sets out the terms of reference in considering such applications and the Board, prior to making a recommendation to the Lieutenant-Governor-in-Council may:

(a) give notice of the application for a proposed New Town,

(b) cause a public hearing to be held at which any person may make representation with regard to the proposal,

(c) refer the application to the Local Authorities Board for a recommendation on the financial aspects of the proposal, and the Local Authorities Board may, if it deems necessary, require the applicant to file certain material and may hold a hearing thereon,

(d) engage independent consultants or technical experts to report to them on any phase of the proposed New Town's development.

Prior to the application for New Town status, Council of the Town of Redwater resolved to have prepared a General Plan pursuant to The Planning Act, 1963, as amended, and requested the Provincial Planning Director to undertake the preparation of the General Plan. On December 2nd, 1966, the Minister of Municipal Affairs issued a Development Control Order and subsequently the Town Council enacted a Development Control By-law which came into force on January 11th, 1967.

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THE IMPERIAL ALBERTA FERTILIZER COMPLEX

The planned fertilizer manufacturing complex will be sized to produce approximately 500,000 short tons (2,000 lb. ton) per year of phosphatic and nitrogenous fertilizers. The complex will consist of two separate plants, namely a NITROGEN FERTILIZER PLANT and a PHOSPHATE FERTILIZER PLANT.

NITROGEN FERTILIZER PLANT - will produce 600 tons per day of anhydrous ammonia and 550 tons per day of prilled and coated ammonium nitrate. The major raw materials will be natural gas received by pipeline.

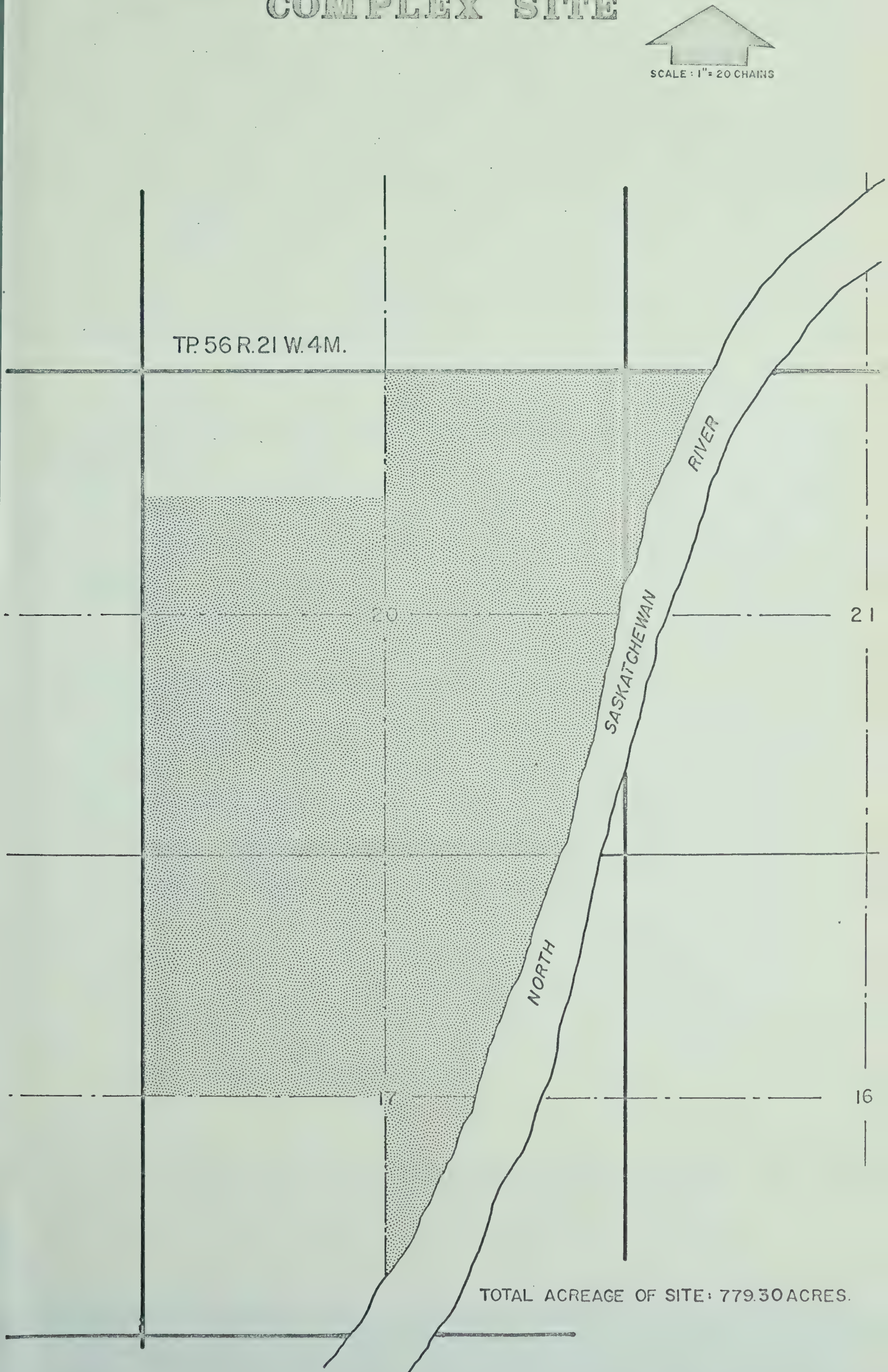
PHOSPHATE FERTILIZER PLANT - will manufacture 1,100 tons per day of granular ammonium phosphate fertilizers. The major raw material will be 1,400 tons per day of phosphate rock and 380 tons per day of sulphur and anhydrous ammonia. Shipments of the raw material will be by rail and truck.

The complex will be located in the County of Thorhild, seven miles south of Redwater and adjoining the west bank of the North Saskatchewan River. The overall site area will be approximately 800 acres (Figure 1). Operating personnel for the plants will number approximately 350.

Work has commenced on the clearing and levelling of the site. The earth work is to be completed by September, 1967, after which construction of the plants will commence. At the peak of construction, in the latter half of 1968, it is anticipated that a work force of 1,100 to 1,500 persons will be employed. Completion of the

plant is schedule for the spring of 1969. No provision for a construction camp has been made nor is one contemplated on or near the plant site. Therefore, construction workers as well as permanent personnel will be required to find living accommodation in the surrounding communities.

IMPERIAL ALBERTA FERTILIZER COMPLEX SITE



TOTAL ACREAGE OF SITE: 779.30 ACRES.

FIGURE: 1

THE REGION

(a) The proposed fertilizer plant will be located on a site comprised of the following lands lying west and adjacent to the North Saskatchewan River, viz:- parts of Sections 17, 20 and 21, in Township 56, Range 21, West 4th Meridian (Figure 1). Existing incorporated settlements located within a radius of ten miles of the plant site are Gibbons, Bruderheim, Fort Saskatchewan and Redwater (Figure 2).

The following table indicates the present and projected population figures for each municipality.

TABLE 1

	1966	1951 - 1966 Period		Projected 1981
		Increase	Decrease	
Gibbons	230	20.00%		321
Bruderheim	290		25.00%	244
Fort Saskatchewan	4,152	286.00%		7,296
Redwater	1,041		20.00%	811

From the foregoing table it will be noted that the Village of Gibbons and the Town of Fort Saskatchewan indicate a growth in population while the Village of Bruderheim and the Town of Redwater show a decline in population for future years. With the establishment of the fertilizer plant and other industries in the area, the projected population figures will change. The effect will be more noticeable in some and less in others.

VILLAGE OF BRUDERHEIM - The present function of Bruderheim is that of a limited service centre for the surrounding agricultural district. Because of the distance and the indirect route from the proposed fertilizer plant, and the limited services available, it is unlikely that permanent employees of the plant will choose to reside at Bruderheim.

VILLAGE OF GIBBONS - Primarily a service centre for the surrounding agricultural area. The proposed fertilizer complex will be located nine miles directly east of Gibbons and will be connected by a hard surfaced road, and as in the case of Bruderheim, the services available in Gibbons are limited and also with the short travelling distance from Gibbons to Edmonton (20 miles) on a paved main highway, it is highly improbable that any great amount of permanent employees of the plant will reside at Gibbons.

TOWN OF FORT SASKATCHEWAN - Up to 1952 the Town was primarily a service centre for the surrounding agricultural area, and since then has been experiencing a steady industrial expansion in and adjacent to the Town, viz:- nickel, fertilizer, chemical and glass plants. The land within the Town boundary is fully utilized and any increase in population would result in land having to be annexed.

TOWN OF REDWATER - Originally a service centre for the agricultural area in the vicinity, but with the discovery of oil and gas in the latter part of 1948 the Town experienced a tremendous growth (in 1951 the population had increased to 1,458 from 160 people in 1948). Since this boom era there has been a gradual decline in population brought about by mechanization within the oil industry.

The location of the fertilizer plant has been governed to a considerable extent by the Federal Governments designation of this region under the Area Development Program which is aiming to improve the economic situation in the Redwater district.

In assessing the relative merits of Redwater and Fort Saskatchewan as potential growth points brought about by the proposed fertilizer plant, the ability to accommodate the required labor force residentially has a definite bearing on the final choice.

Assessment of population required to be housed:

Permanent staff	300
Maintenance, seasonal workers, etc.	50
	350
Service workers (2 per every 15 workers)	46
	396
Provincial average of 75% married workers out of total labor force	297
Assuming average family size of four persons	1,188
∴ Total new population 1,188 + 99	1,287

In assessing housing needs it must be noted that there is a strong likelihood of 20-30 assistant shop foremen at present employed by Sherritt-Gordon leaving to take employment in the new plant. These workers are living in Fort Saskatchewan and no doubt will continue to do so.

Hence a fresh calculation produces the following:

Permanent workers 300 - 30	270
Maintenance, seasonal workers, etc.	50
	320
Service workers (2 per 15 workers)	42
Total	362
Married workers (75% of 362)	271
Average size family of four persons	1,084
Total new population to be housed 1,084 + 91	1,175

The Town of Fort Saskatchewan envisages the provision of additional residential land to provide a total of 30 individual lots and 24 suites by 1968. The Town of Redwater on the other hand, has 127 individual lots immediately available within the Town boundary and another 48 lots north of Fourth Avenue North (outside existing Town boundary). In addition, land can be made available on the west side of First Street West and south of Third Avenue South providing a total of 30 lots. An area of 24 acres has been set aside for apartments and at a density of 26 apartments per acre a total of 216 apartments could be provided. Thus on balance the Town of Redwater is in a far better position to provide the necessary lots when required for housing the workers at the proposed fertilizer plant.

REDWATER & ENVIRONS

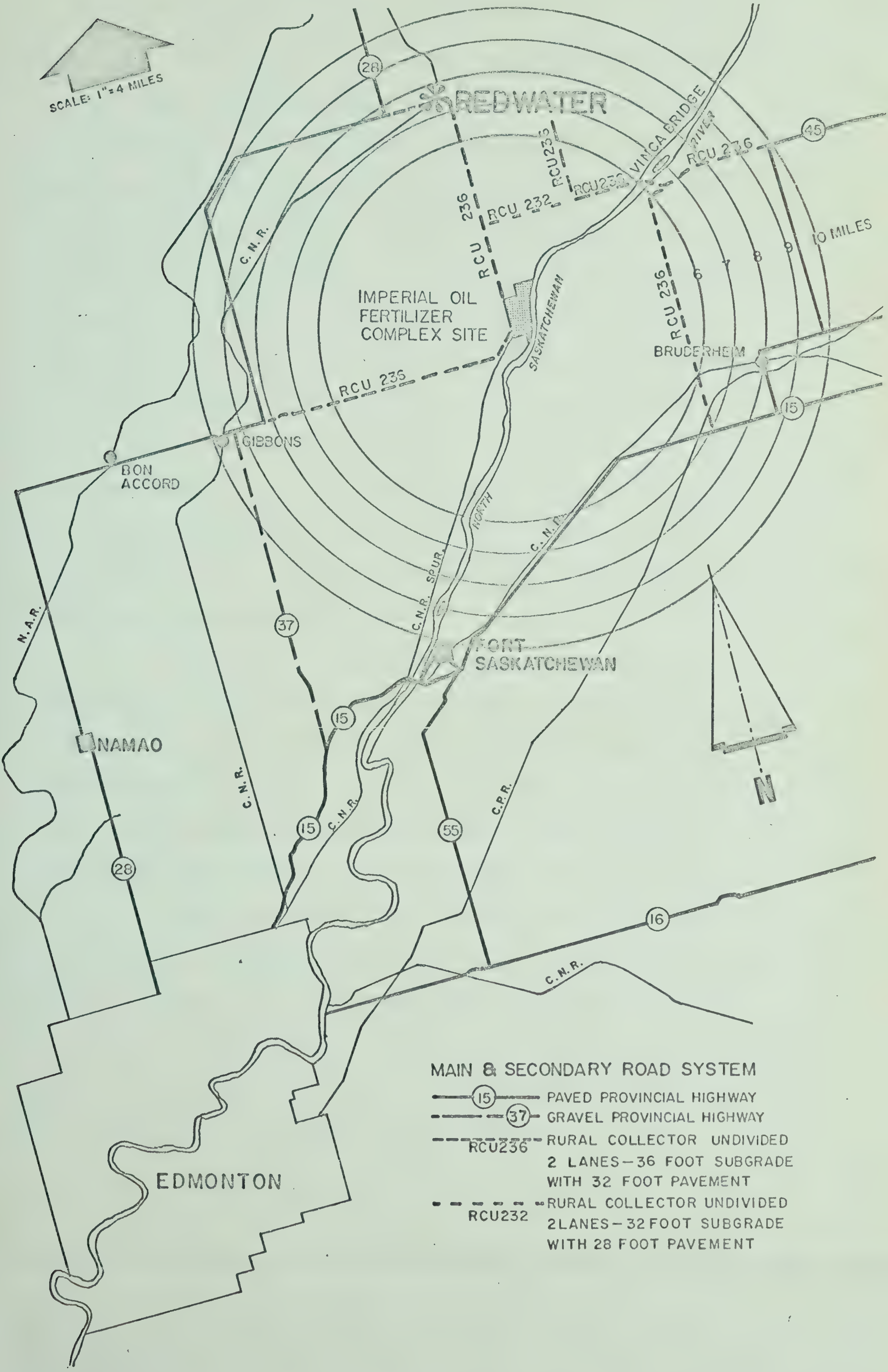


FIGURE 2

(b) Arrangements are being made by Imperial Oil Limited to service their fertilizer complex with railway facilities and a network of highways, both main and secondary (Figure 2). The secondary roads from the plant site will connect with Provincial highways, numbers 15, 28, 37 and 45, thus providing a means for the transportation of raw materials to the plant and the finished products to market. The improved secondary roads will also provide first class all-weather access to the existing incorporated municipalities where the permanent employees of the plant will choose to reside. Six miles downstream from the plant, a bridge across the North Saskatchewan River is being constructed (Vinca Bridge) and will provide access to Bruderheim and to the area south of the river. Upstream from the plant, at Fort Saskatchewan, there is an existing bridge across the Saskatchewan River.

Pursuant to the secondary road system a grant of up to $277,000 has been provided by the Provincial Government for the up-grading of the road west from the plant site connecting with highways number 28 and 37, to R.C.U. 236 standard. Reconstruction of the nine mile stretch of road has commenced. This portion is within the Municipal District of Sturgeon (Figure 2).

The road directly north from the plant site to the Town of Redwater, a distance of seven miles is to be up-graded to R.C.U. 236 standard. Since this road is not a part of the secondary road system, the construction of the road will be borne by the County of Thorhild with a possible grant from the Provincial Government. Construction of the road will not commence before 1968.

The road east from the plant to within two miles of the Vinca Bridge is to be up-graded to R.C.U. 232 standard and the two miles to the bridge and connecting with Highway No. 15 and 45 is to be up-graded to R.C.U. 236 standard (Figure 2).

The Canadian National Railway will build a spur line from their main line at Fort Saskatchewan to the fertilizer plant. The spur line will parallel the Saskatchewan River and the right-of-way has been established.

The road east from the plant and the road south and east from the bridge is part of the Secondary Road System.

Also to be taken into consideration are additional employees who will be employed in other industries locating in the Redwater area. Presently an engineering consulting firm is planning an industrial estate located a half mile south of the Town of Redwater and in connection with the estate the firm have requested the Town to provide forty residential lots to accommodate employees. Negotiations are presently in progress for one industry to establish there shortly. Information on the type and magnitude is not available while negotiations are in progress.

NOTE: R.C.U. 232 denotes Rural Collector Undivided - 2 lanes
32 foot subgrade with 28 foot pavement.

R.C.U. 236 denotes Rural Collector Undivided - 2 lanes
36 foot subgrade with 32 foot pavement.

(c) The municipalities of Fort Saskatchewan, Redwater and Gibbons are or will experience some difficulty in obtaining an additional supply of potable water to meet the demand due to the increase in population which will result from industries locating in the area. This is also applicable to the industries themselves. As a result, the Council's of the Village of Gibbons, Towns of Fort Saskatchewan and Redwater, Counties of Strathcona and Thorhild and Municipal District of Sturgeon have had a preliminary study made of the water problem by the firm of Associated Engineering Services Limited.

The foregoing evidence indicates the Town of Redwater should be selected as the community to be expanded, to accommodate the employees of the proposed fertilizer plant and such other industries as might locate in the vicinity.

LAND REQUIREMENTS (up to 1981)

Projected new population of Redwater is as follows:

1971	2,908
1976	3,561
1981	4,292

For a town with a population of 4,292, acreages of major land uses have been calculated as follows:

(a) Residential

For 3,734 persons at 16 persons per acre (net) based on 4 houses per acre (net) and 4 persons per house = 233 acres

(b) High Density Residential

For 558 persons at 50 persons per acre based on 2.5 persons per suite and 20 suites per acre (net) = 11 acres

(c) Commercial - High Density

Based on a standard of 3.1 acres per 1,000 and an average of 63.7 lineal feet per 100 population (Bartholomew)

= 13 acres

(d) Industrial

Based on a standard of 5.7 acres per 1,000 population (Bartholomew)

= 25 acres

(e) Educational

Approximately 30% of the population will be of school age. Therefore, schools for 1,287 pupils are required. Present pupil population is 507, thus accommodation for 787 pupils is required. The existing schools can accommodate an increase in school population (Grades 1 to 12) amounting to 233 at this point in time, leaving new accommodation to be provided for 554 pupils. Distribution of pupils into various grades would be as follows:

Grade	Percentage	No. of Pupils	Existing Pupils	Pupils to be in new premises
Elementary	60%	775	381	394
Junior High	24%	306	193	112
Senior High	16%	206	180	26
	100%	1,287	754	532

The School Board state that land requirements are assessed at 5 acres for the first 100 pupils and 1 acre for each subsequent 100. Approximately 25% will be in Separate Schools and 75% in Public Schools. Thus total acreage required - 17 acres

Separate Schools	4.25 acres
Public Schools	12.75 acres

(f) Parks, Playgrounds and Other Public Uses

Based on National Recreational Association standard of 10 acres for 1,000 population = 22.5 acres - 90.20

4. Educational	17 acres	4. 12.79 acres - The County School Superintendent has suggested that should high school enrollment increase, a new high school in Redwater would be possible - recommended area of 20 acres.
5. Parks, Playgrounds and Public	22.5 acres	5. 90.20 acres which includes a golf course of 71.8 acres

PRELIMINARY
WATER AND SEWER STUDY
FOR THE
TOWN OF REDWATER

Respectfully submitted,

ASSOCIATED ENGINEERING SERVICES LTD.

G. C. Fuerst, P.Eng.
April 27, 1967

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APPENDIX A

Figure 1 - Population
Figure 2 - Estimated Water Consumption

Drawing No. 3164-WM-67-1 - Existing Water Supply
Drawing No. 3164-WS-67-2 - Waterworks System
Drawing No. 3164-SM-67-3 - Sewerage System

PRELIMINARY
WATER AND SEWER STUDY
FOR THE
TOWN OF REDWATER

PURPOSE

The purpose of this report is to present the findings of a preliminary study of the existing waterworks and sewerage systems in the Town of Redwater. Projections are included regarding possible future requirements and costs of water supply and sewage disposal facilities.

This report shall be considered as a preliminary report and is intended to serve only as a base for further detailed studies prior to expansion of the Town.

AUTHORIZATION

This report was authorized on March 17, 1967 by representatives of the Council of the Town of Redwater.

TERMINOLOGY

The Imperial gallon measure has been used throughout the discussion and calculations of the study. "Imperial gallons per minute" has been abbreviated to "Igpm". "Imperial gallons per capita per day" has been abbreviated to "Igpcd".

BACKGROUND

In the late 1940's and early 1950's, the Town of Redwater found itself in the midst of a vast oil exploration and development program. With this came an expansion of the Town and facilities to serve an increased population.

Around 1950, Imperial Oil Limited installed the following utilities to provide water and sanitary sewer service to residences built in the northwest portion of the Town:

1) Infiltration gallery and pumphouse on an island at the junction of the Redwater River and the North Saskatchewan River;
2) A water supply line believed to be of four, six and eight inch steel pipe from the river pumphouse to the Town;
3) Partially underground steel water storage tanks for approximately 40,000 Imperial gallons and high lift pumping facilities in the Town;
4) A water distribution system of four, six and eight inch steel pipe;
5) A sewage collection system of eight and ten inch pipe;
6) A twelve inch sewage outfall line; and
7) Sewage treatment works on the bank of the Redwater River and northeast of the Town.

In the years that have followed, the Town has expanded the systems to include the following:

1) Water distribution system of four, six and eight inch asbestos cement pipe serving almost all other residential and commercial areas of the Town;
2) Elevated water storage (watersphere) for 42,000 Imperial gallons;
3) Sewage collection system serving almost all other residential and commercial areas of the Town; and
4) A water treatment plant approximately one mile east of the Town. This plant has clearwell storage for approximately 28,000 Imperial gallons of treated water.

The present waterworks system provides water to the Town of Redwater and a gas plant adjacent to the water treatment plant.

A recent announcement indicates that a fertilizer plant is to be constructed south of Redwater on the north side of the North Saskatchewan River. This is expected to result in a sharp increase in the population of the Town and thus place greater demands on the existing waterworks and sewerage systems. Furthermore, it is expected that an additional industrial complex southeast of the Town will require that water be provided by the Town for process and domestic needs.

POPULATION

Since 1950, the previous population of the Town has fluctuated between 1,300 and 1,100 people. This is partially the effect of the degree of activity of the petroleum industry in the area.

No specific information is available on the extent of future industrial development around Redwater, the time at which such development may occur or the effect of such development on the population of the Town. As a result, for purposes of this report, it is assumed that the population will increase sharply in 1967 and gradually "taper off" to reach 3,750 by 1977, and 5,000 by 1988.

It is to be noted that these population projections are a preliminary estimate only.

DEVELOPMENT AREAS

Preliminary studies carried out by the Provincial Planning Advisory Board indicate that future residential expansion should be considered west and north of the present Town. From the preliminary sanitary sewer utility study carried out recently, this development pattern appears justifiable and reasonable, that is, the land generally slopes to the northeast. Providing sanitary sewer service to these areas is relatively easy if development progresses from an east to west direction. For this report, the areas of development have been arbitrarily numbered as shown in Table 1.

Table 1

Areas of Development

Area No.	Description
1	Existing commercial and residential areas north and west of railway.
2	Existing residential and commercial areas south of railway.
3	High land in south portion of 30-57-21-4 (approximately 50 acres).
4	West half of southwest quarter 30-57-21-4 (approximately 65 acres).
5	Southeast quarter 25-57-22-4 (approximately 160 acres).
6	Low land in north portion of 30-57-21-4 (approximately 200 acres).

Due to the preliminary nature of this report, details of population densities are not considered. This, of course, must be determined for the final analysis when specific water mains and sewer mains must be sized.

WATERWORKS SYSTEM

PREVIOUS CONSUMPTION

Only limited data was available concerning previous water consumption.

For the months of January, February and March 1967, the average water consumption was:

Average consumption	48, 000 Igpd
Average consumption per capita	42 Igpcd

As pointed out previously, the Town also supplies water to the gas plant. The water drawn by the plant varies from 38, 000 Igpd (26 Igpm) in the winter to 60, 000 Igpd (42 Igpm) in the summer.

DESIGN CRITERIA

Consumption

For purposes of design of future water supply facilities, the average annual domestic consumption rate is estimated to be 60 Igpcd. The average annual water rate required by the gas plant is assumed to be 35 Igpm.

Aside from the average annual consumption, "peak days" are experienced when more water is consumed than on any typical average day. The domestic consumption for the peak day is estimated to be two times the average annual demand or 120 Igpcd. The "peak day" use of the gas plant is estimated to be 45 Igpm for design purposes.

Fire Protection

For a town of the present size of Redwater, the waterworks system should be capable of delivering approximately 500 Igpm for at least three hours for fire fighting purposes. This is equivalent to a volume of water of 90, 000 Imperial gallons. With an expansion of the Town, this requirement may be increased to an equivalent volume of 300, 000 gallons.

Storage

Surplus water storage is required in any waterworks system to meet intermittent peak demands, for fire protection and also to provide water to the system in the event of an interruption to the water supply. It is generally considered adequate to provide sufficient storage to satisfy the peak day demand plus the volume required for fire protection.

WATER SUPPLY

Requirements

The water supply facilities should be capable of meeting the peak day demand requirements. The peak day water demand expected for various populations, including the existing gas plant, is shown in Figure 2.

Existing Supply

The existing infiltration gallery is nearing the end of its usefulness. It is nearly twenty years old and certainly has served the Town very well.

Recent tests carried out by the Town's maintenance personnel indicate that the capacity of the infiltration gallery is approximately 100 Igpm. This may increase somewhat with the coming of spring when the level of the North Saskatchewan River rises.

The existing two vertical turbine pumps are driven by 10 horsepower electric motors. The approximate pumping capacity is:

No. 1	80 Igpm
No. 2	100 Igpm
Both pumps	110 Igpm

By running both pumps, the tests have indicated that the gallery can be "pumped dry".

Existing Supply (Cont'd.)

As shown on Figure 2, the present situation is critical. The existing gallery can provide sufficient water to satisfy only the average annual demands of the existing population and existing industry. Water shortages can be expected during peak periods if any expansion of the Town takes place.

New Supply Alternatives

A new or additional source of water must be located and made available to the Town. Work must start immediately as any delays could result in serious water shortages during the coming summer.

There are several water sources to be considered:

Groundwater,
The Redwater River,
The island which is the present source,
The North Saskatchewan River, and
The City of Edmonton.

Each of these will be discussed below:

1) Groundwater

Only limited information exists regarding the availability of a suitable source of groundwater. Little hope is held for locating an economical source of groundwater with sufficient capacity to serve the present and future demands of the Town.

This alternative should not be considered. Quite an extensive and expensive test drilling program would be required. At this time, it is suggested that funds be directed to developing a more likely source in a location that would require a minimum of pipe line to direct water to the Town.

New Supply Alternatives (Cont'd.)

2) The Redwater River

With off-stream storage provided in the form of a large ground storage reservoir, this river apparently has sufficient flow to supply the needs of the Town for many years. No flow records are available but the river does drain a large area to the northeast and runs most of the time.

For several miles upstream from the Town, oil wells are located directly in the broad river valley. Oil line breaks and oil losses have been known to occur. Such a situation is most undesirable when considering a domestic water supply. Water polluted by petroleum products is difficult to treat.

At this time, this water source is not recommended.

3) Gravel Island

The gravels in the island in the North Saskatchewan River are presently tapped by the old wooden infiltration gallery to provide water to the Town.

It is possible that a second infiltration gallery or large diameter well can be developed on the island and located so that there is little interference with the existing infiltration gallery. Inasmuch as the Town faces a serious water shortage in 1967, testing and investigation work should commence immediately.

Infiltration facilities in the gravels to provide a source of water are not expected to be the answer for the future long-term demands of the Town. It should be considered as an interim solution only until plans and financing can be arranged for a more reliable source of water.

New Supply Alternatives (Cont'd.)

4) North Saskatchewan River

This is the largest water source available to the Town of Redwater.

The point at which water could be drawn from the river is downstream from Edmonton, downstream from Fort Saskatchewan, downstream from the existing industries in the Edmonton area and downstream from expected future industries along the river. With an ever increasing amount of wastes being disposed of in the river, treatment of the water drawn near Redwater would involve a high initial capital cost and a high operating cost. It is expected that the condition of raw water in the river will not improve in the years ahead. Therefore, with the passage of time, the cost of water treatment operations and equipment required will increase.

If no other sources of water are available, then this must be considered as the only solution to the water supply problem.

It would be necessary to construct a river intake and pumphouse, an elaborate water treatment plant and a new supply line from the river to the Town. Such a treatment plant would be based on capacities necessary to serve the expected population in ten or twelve years. If the population and water demands continue to increase after that time, additions to the plant and improvement of the original equipment would be necessary.

New Supply Alternatives (Cont'd.)

5) The City of Edmonton

Some preliminary research and investigation has been undertaken regarding the installation of a water line from Edmonton to Redwater. Such a line would provide treated water to the Town of Redwater, The Town of Fort Saskatchewan and any industries located in the area.

The details of the feasibility and economics of such a scheme are beyond the scope of this report. However, this overall concept of an urban - industrial water supply line must be considered in greater detail. If the economics indicate that this source is feasible, then this is probably the best long-term source of water supply for Redwater.

Temporary Addition

Until an adequate and reliable permanent water source can be provided to the Town, additional supplies must be developed. These supplies must be considered as temporary only to augment the present supply from the infiltration gallery. The intention is to meet an increased water demand which is expected to occur in 1967 and continue to increase.

This temporary additional supply in the amount of 60 Igpm probably can be obtained from gravel deposits in the island as discussed under paragraph 3 above. However, this can only be determined by a testing program which should commence immediately.

WATER SUPPLY LINE

The existing steel supply line is nearing the end of its useful life. Four leaks, apparently due to corrosion of the metal, occurred in 1966. More are expected in 1967 and the years to come.

Furthermore, because of the topography and small size (believed to be four, six and eight inch), relatively high pumping pressures (approximately 100 psi) are required to force the water from the pumphouse to the water treatment plant. Although no tests have been conducted, it is assumed that this old steel line is capable of delivering more water at much higher operating pressures. Operating at higher pressures would require that larger pumps be installed. A booster station half way along the line would be a more efficient method of increasing the capacity of the supply line.

Until the future long-term water source has been established, no water supply line replacement is recommended at this time. As a result, the Town should be prepared to quickly repair any future leaks that may develop so as to reduce "shut-down" time to a minimum. (From previous experience, repairing each break or leak costs approximately $250 to $350.)

TREATMENT PLANT

Based on preliminary studies and operating information made available, considerable normal repairs and improvements must be undertaken at the water treatment plant. This is necessary in order to bring the plant up to peak operating efficiency. All items of equipment should be thoroughly checked, repaired if necessary and tested. This must be done immediately.

It is expected that the plant, when operating efficiently, can produce at least 150 Igpm of treated water, considering the present type of raw water available.

Referring to Figure 2, the rate of 150 Igpm will satisfy the average annual consumption for a population (with the gas plant) of 2,800. During peak periods, this rate will meet the consumption of a population (with the gas plant) of only 1,250. If the demand exceeds 150 Igpm and the raw water provided must be treated, then additional treatment facilities may have to be considered.

STORAGE

Requirements

Water storage is necessary in a waterworks system to provide surplus water over and above that which can be supplied by the supply facilities for:

1) Peak consumptions,
2) Fire fighting purposes, and
3) Emergency supply if supply facilities are inoperative.

It is generally considered adequate to provide sufficient water in storage to meet the peak day consumption plus fire fighting requirements. Considering a future population of even 3,500 plus industry, the future storage required is:

Domestic	420,000 Imperial gallons
Industry	100,000 Imperial gallons
Fire protection	300,000 Imperial gallons
	820,000 Imperial gallons

Existing Facilities

The existing storage consists of:

Clearwell at treatment plant	28,000 Imperial gallons
Tanks at high lift pumphouse	40,000 Imperial gallons
Elevated storage	42,000 Imperial gallons
	110,000 Imperial gallons

Existing Facilities (Cont'd.)

This is not sufficient storage for the present population requirements and industry demands. Additional water storage is necessary, even if the Town does not expand.

Additional Storage

Before details on the size and type of additional storage to be constructed can be determined, a more definite future design population must be established. It is recommended that additional storage of approximately 1,000,000 Imperial gallons be considered at this time to serve the expected future population.

HIGH LIFT PUMPS

The existing high lift pumps located in the Town must be kept in good operating condition.

When a new water source for the Town has been established and additional water storage provided, it is expected that this pumphouse (and steel ground storage tanks) can be abandoned. Until then, this high lift pumping equipment is a vital and necessary facility for the waterworks system.

DISTRIBUTION MAINS

The original water mains installed in the northwest area of Town are of steel pipe. Considering the soil condition in Redwater, the life expectancy of these lines is indeed limited. Although no serious leaks or corrosion problems have been experienced to date, it appears that the steel pipe contributes to a rust problem in the water.

Replacement of these mains is not immediately necessary but must be considered some time prior to the paving of the road surfaces above any such steel line.

No problem is foreseen in providing water service to proposed development areas (3, 4, 5 and 6). Some definite plans must be prepared as to population densities in these areas so that water demands and mains sizes can be determined.

With an increase in commercial development in the central part of Town, some additional water mains will be required to provide for the greater water demands.

ESTIMATED COSTS

The following estimated costs are based on a preliminary study only. Prior to the construction of each proposed facility, a detailed study must be undertaken to establish final construction design, site location and estimated costs for bylaw purposes.

1) Temporary Additional Water Supply

Investigation of island gravels	$ 6,000
Construction of wells or gallery	12,000
Booster station on supply line	6,000
Increase treatment plant efficiency	5,000
	$ 29,000

2) North Saskatchewan River Supply

Intake and pumphouse	$ 135,000
Treatment plant	200,000
New supply line	260,000
Total cost (Stage 1)	$ 595,000
Future addition to plant (Stage 2)	175,000
Total long term cost	$ 770,000

3) Edmonton-Redwater Supply Line

Overall estimated cost (Details of financing such a project have not been finalized but would probably involve the municipal governments and industry benefiting from such a utility.)	$2,085,000

4) Additional Water Facilities

New distribution mains required in 1967	$ 25,000
Storage in 1968	160,000
Replacement of steel distribution mains in 1968	40,000

SEWERAGE SYSTEM

PREVIOUS FLOWS

No records are available for previous sewerage flows.

DESIGN CRITERIA

It is generally acceptable to consider average daily sewerage flows as equivalent to the average daily water consumption.

As stated previously in the section of Design Criteria for the Waterworks System, the average water consumption for design purposes is estimated to be 60 Igpcd. For sewerage system design, the sewage flows are also estimated to be 60 Igpcd.

Peak sewage flows in excess of the average sewage flows occur each day. For this reason, main trunks and outfall lines must be capable of carrying at least three times the average flow.

COLLECTION SYSTEM

The preliminary study indicated that the condition of the existing sewer mains was satisfactory. No replacement of existing mains appears necessary.

The twelve inch existing outfall line out of Town has sufficient capacity to serve a population of approximately 5, 000 people. A detailed survey and determination of the grade or slope of the line will be necessary to verify this capacity. No improvements are considered necessary at this time.

A new sewer main is essential to serve the proposed commercial-residential complex proposed for the central part of the Town. Based on the preliminary data available, providing sewer service to proposed residential areas 3, 4, 5 and 6 is not difficult. A new trunk main starting from the railway tracks and connected to the existing outfall line can be installed through areas 3, 4 and up into area 5. This line

would have to be approximately 16 to 20 feet deep. It is assumed that suitable soil conditions exist so as to make the installation feasible and economical.

Because area 6 is relatively low, a separate outfall line would be required to provide service. As a result, it would appear that this should be the last area to be considered for residential development.

SEWAGE TREATMENT

Requirements

The existing sewage treatment facilities are not adequate for the present population. Improvements are definitely required, regardless of whether or not the Town expands.

New treatment facilities could consist of:

1) Mechanical treatment plant,
2) Stabilization lagoon, or
3) Oxidation ditch.

1) Mechanical Treatment Plant

Because of initial capital costs, operating costs and operating problems, this method is not recommended for the Town.

2) Stabilization Lagoon

Considering a future population of 3, 500 a lagoon would require a land area of approximately 35 to 40 acres. At this time, this is not recommended because of the probable high cost of land and the availability of such a suitable land area which is free of existing oil pipe lines. Furthermore, future expansion may also be restricted because of the lack of additional available land.

Requirements (Cont'd.)

3) Oxidation Ditch

This method of sewage treatment employs a shallow circular ditch and a clarifier. Through the use of large rotor assemblies mounted over the ditch, oxygen is mixed with the incoming sewage to accomplish the necessary oxidation processes. From the ditch, the sewage is directed to the clarifier where the sludge settles out and the remaining liquid is discharged continuously to a stream or river.

Considering land, degree of treatment, and ease of expansion, it would appear that this method of sewage treatment should be adopted by Redwater. A land area of approximately five or six acres would be required. The preliminary site selected is due east of the Town adjacent to the Redwater River. Other sites may be equally suitable and would depend on land costs, accessibility and topography. Further study is definitely required.

If the proposed site is finally chosen, it will be necessary to install an additional section of outfall line from the existing treatment site to the proposed treatment site.

New Facilities

It is recommended that new sewage treatment facilities be scheduled for 1968. This will permit more time to prepare for the necessary financing. Furthermore, a more realistic rate of development should be known by 1968 and a more economical design of the treatment works will be possible.

ESTIMATED COSTS

The following estimated costs are based on a preliminary study only. Prior to the construction of each proposed facility, a detailed study must be undertaken to establish final construction design, site location and estimated costs for bylaw purposes.

Sewage collection mains required in 1967	$ 25,000
Sewage treatment works in 1968	175,000
Additional new outfall line in 1968	30,000

SUMMARY

CONCLUSIONS

Considering the Town of Redwater as it presently exists with a population of 1,135 there are several serious problems to overcome if adequate water supply and sewage disposal requirements are to be met:

1) An additional or alternative source of water must be located immediately.

2) The existing raw water supply line from the North Saskatchewan River to the Town is reaching the end of its useful life. If a future water source is the North Saskatchewan River, a new supply line must be considered.

3) The water treatment plant requires a thorough maintenance and repair program immediately.

4) Additional water storage is required.

5) Replacement of existing steel water distribution mains must be considered before any further street paving program is undertaken in the northeast area of Town.

6) Sewage treatment facilities must be improved.

With the expected expansion of the Town due to industrial development in the region, the above problems become even more serious, if not critical. Under these circumstances, an additional water supply must be developed or acquired immediately or a water shortage will result. A water shortage could seriously hinder or even stop any further residential and industrial development in the Town.

RECOMMENDATIONS

It can only be assumed at this time that the expected sudden growth of the Town will in fact occur, commencing in 1967.

On this basis and with the preliminary data available to date, the following tentative schedule for action is recommended:

1) A program be undertaken immediately to develop additional wells or a second infiltration gallery on the island in order to temporarily augment the existing supply.

2) The water treatment plant be thoroughly checked, repaired where necessary and tested to bring the plant up to optimum efficiency before the peak summer months.

3) If an additional supply of water can be located on the island, a booster pumping station be installed on the existing steel supply line to increase the capacity of the line.

4) A concentrated effort be exerted to fully assess, and if possible implement, the construction of a water supply line from Edmonton to Redwater to satisfy the long-term needs.

5) A thorough study be made of the proposed residential areas so that future development can be economically and systematically carried out. This would involve the preparation of detailed topographic plans, proposed subdivision design, preliminary design of water, sanitary sewer and storm drainage facilities required.

6) Construction of additional water storage should be planned for 1968. At that time, the future long-term water source should be established and storage can be provided in the most appropriate location to suit the final development plan at that time.

7) Construction of sewage treatment works should be planned for 1968.

COSTS

To upgrade and improve the waterworks and sewerage systems, the Town is faced with the following approximate expenditures. These are preliminary estimates.

1) Immediate costs for 1967

Temporary additional water supply	$ 29,000
New water distribution mains	25,000
New sewage collection mains	25,000
	$ 79,000

2) Future costs for 1968 with North Saskatchewan River water supply:

Water treatment plant and supply facilities	$ 595,000
Water storage	160,000
Replace steel water mains	40,000
Sewage treatment works	175,000
Additional sewage outfall line	30,000
	$1,000,000

3) Future costs for 1968 with water supply from Edmonton:

Redwater's share of water line	$ Unknown
Water storage	160,000
Replace steel water mains	40,000
Sewage treatment works	175,000
Additional sewage outfall line	30,000
	$ 405,000 +

APPENDIX A

FIG. I.

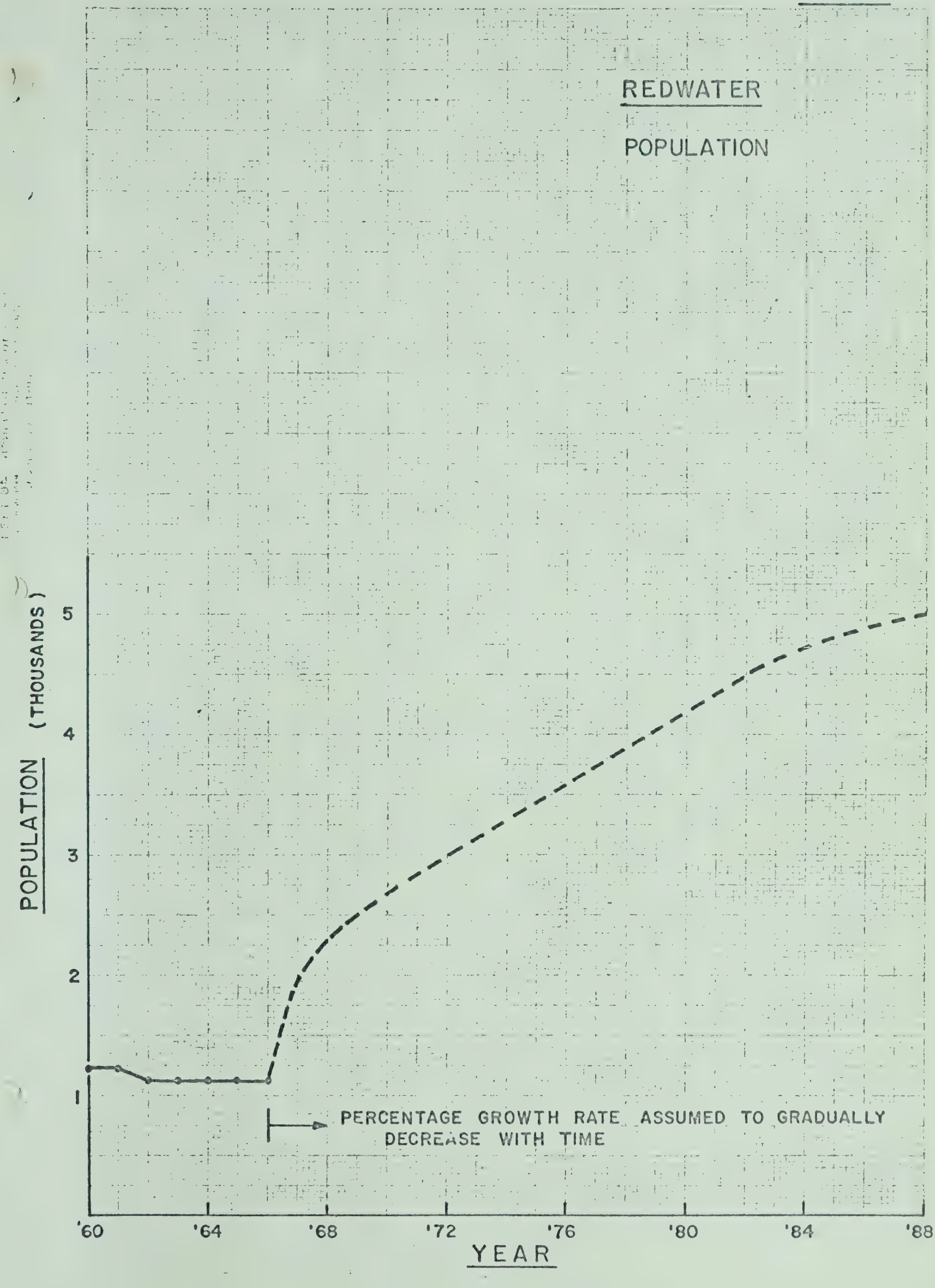
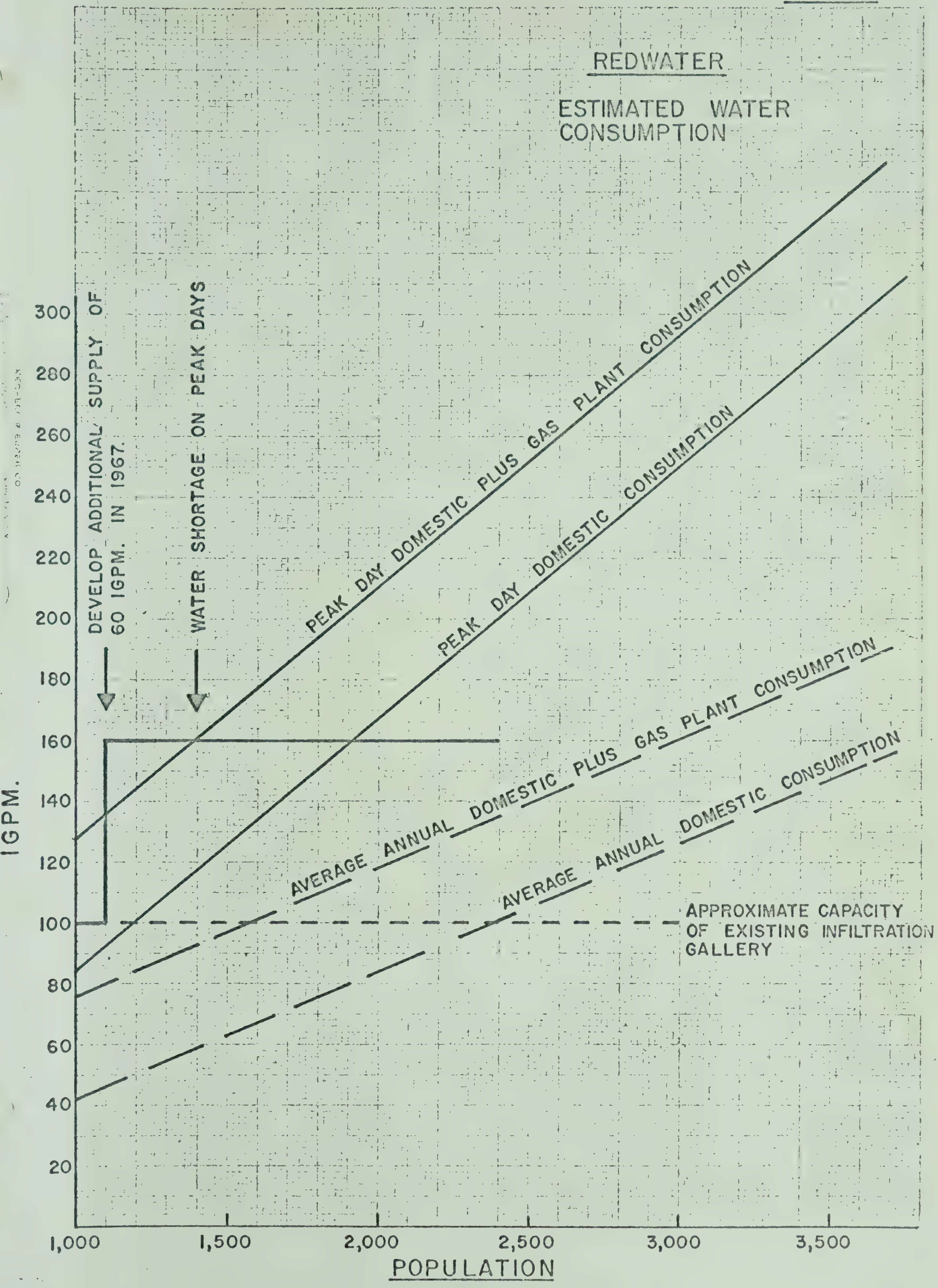
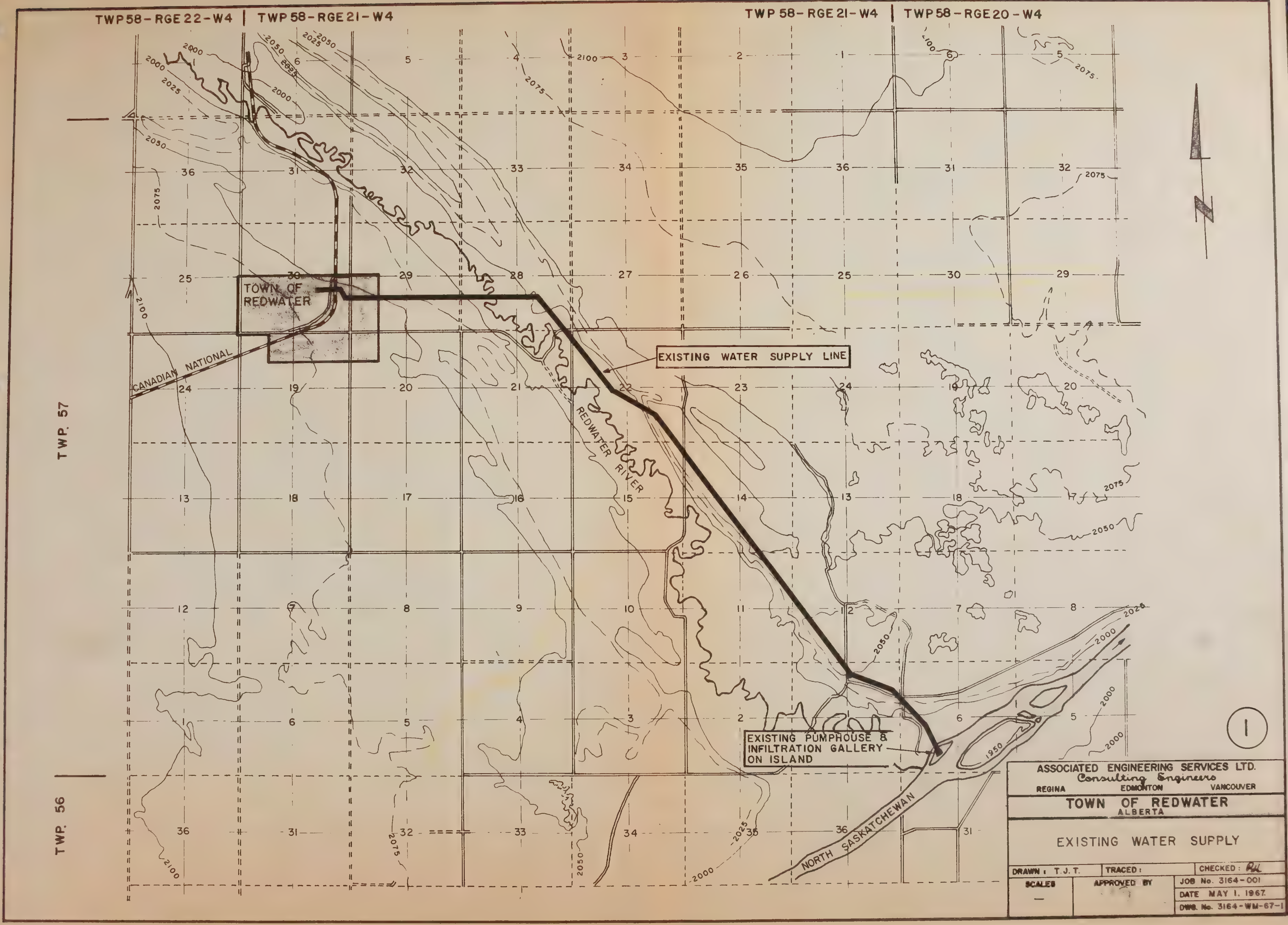

REDWATER
POPULATION
POPULATION (THOUSANDS)
1
2
3
4
5
'60
'64
'68
'72
'76
'80
'84
'88
YEAR
PERCENTAGE GROWTH RATE ASSUMED TO GRADUALLY DECREASE WITH TIME

FIG.2.


REDWATER
ESTIMATED WATER CONSUMPTION
DEVELOP ADDITIONAL SUPPLY OF 60 IGPM. IN 1967.
WATER SHORTAGE ON PEAK DAYS
PEAK DAY DOMESTIC PLUS GAS PLANT CONSUMPTION
PEAK DAY DOMESTIC CONSUMPTION
AVERAGE ANNUAL DOMESTIC PLUS GAS PLANT CONSUMPTION
AVERAGE ANNUAL DOMESTIC CONSUMPTION
APPROXIMATE CAPACITY OF EXISTING INFILTRATION GALLERY
IGPM.
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
1,000
1,500
2,000
2,500
3,000
3,500
POPULATION

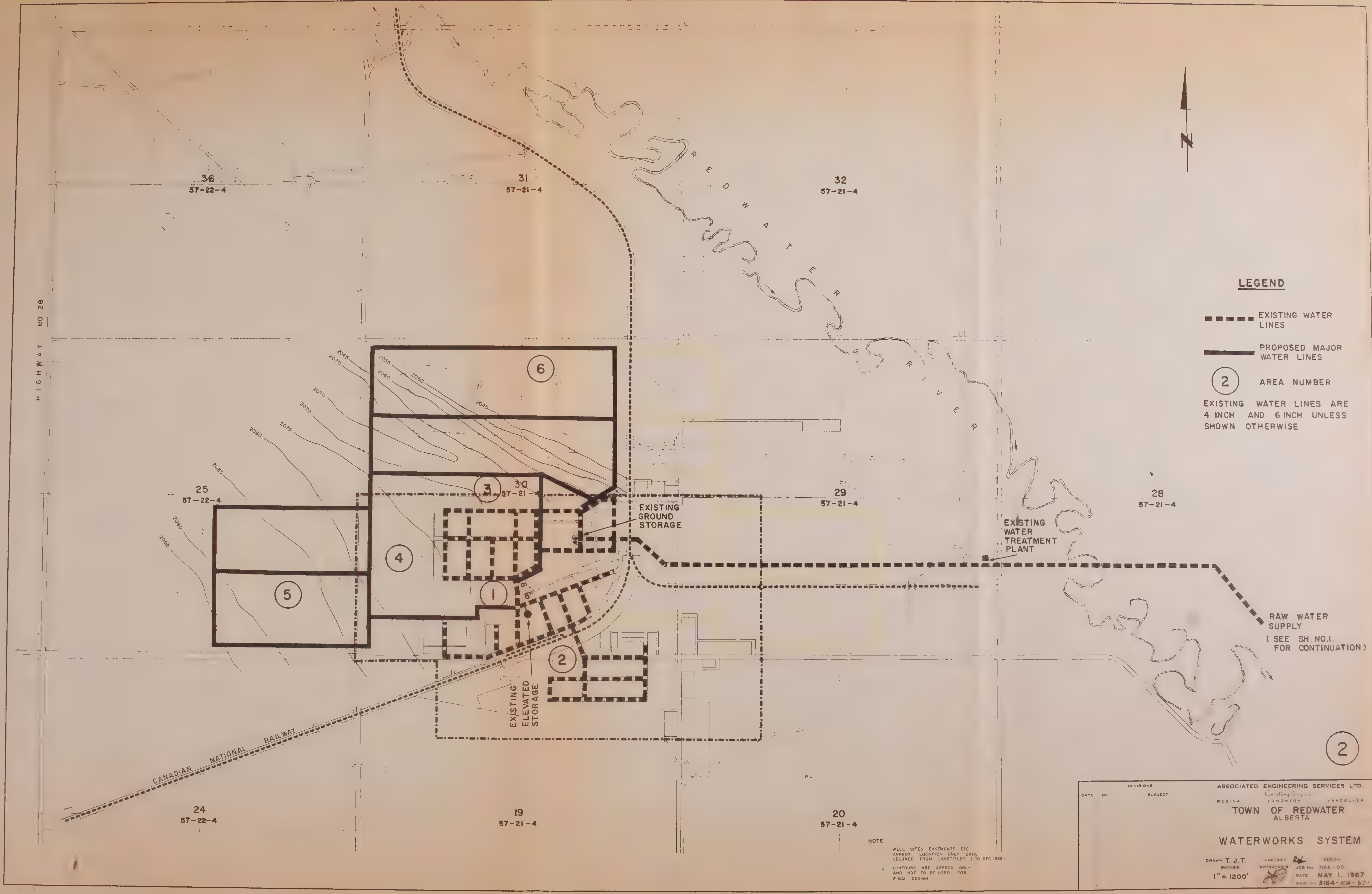


ASSOCIATED ENGINEERING SERVICES LTD.
Consulting Engineers
REGINA EDMONTON VANCOUVER

TOWN OF REDWATER
ALBERTA

EXISTING WATER SUPPLY

DRAWN : T. J. T.	TRACED :	CHECKED : RL
SCALES —	APPROVED BY	JOB No. 3164-001 DATE MAY 1. 1967. DWG. No. 3164-WM-67-1



NOTE

1 WELL SITES EASEMENTS ETC APPROX LOCATION ONLY DATA SECURED FROM LANDTITLES (TO DEC 1966)

2 CONTOURS ARE APPROX ONLY AND NOT TO BE USED FOR FINAL DESIGN

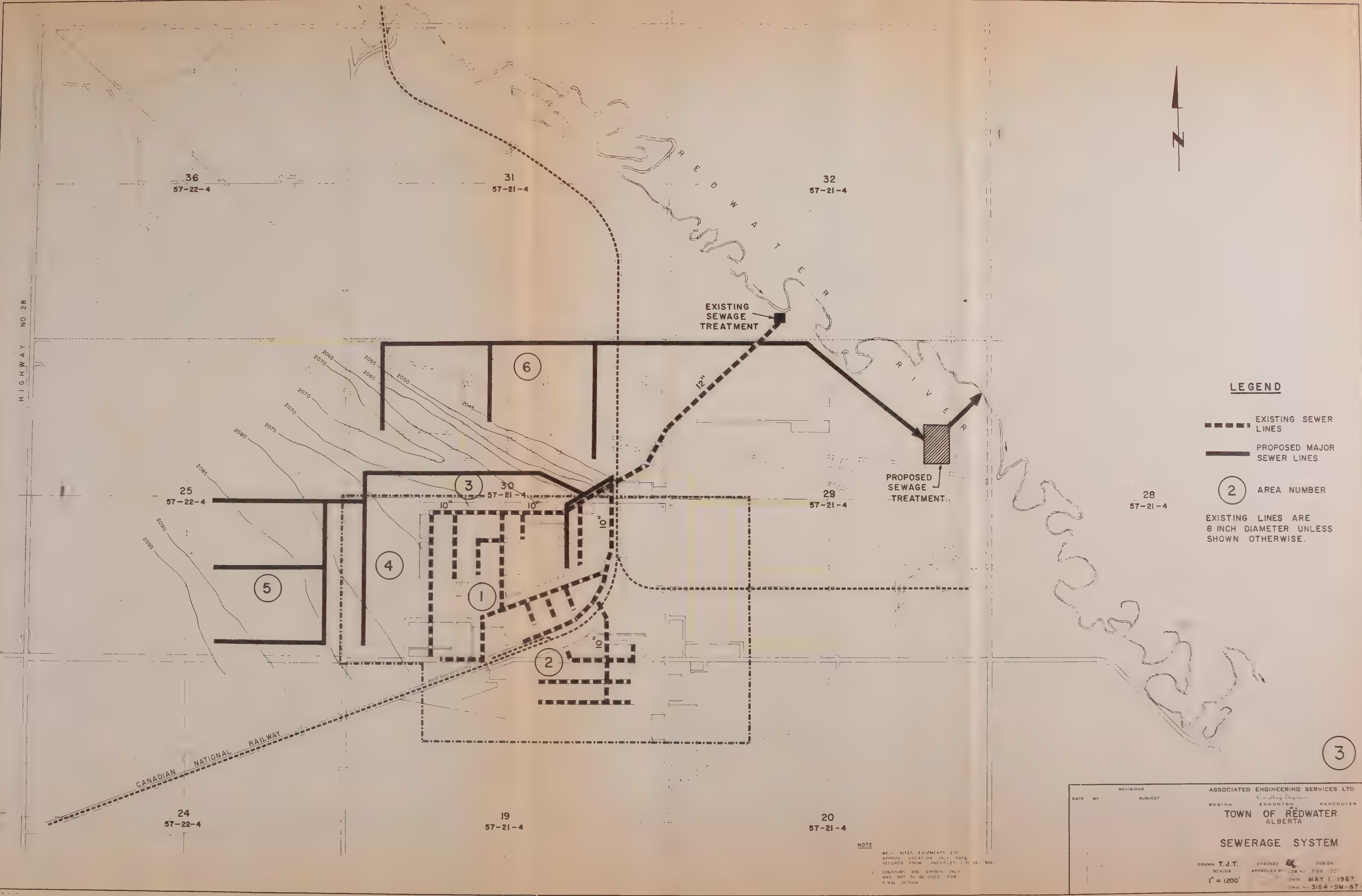
REVISIONS
DATE BY SUBJECT

ASSOCIATED ENGINEERING SERVICES LTD.
Consulting Engineers
REGINA EDMONTON VANCOUVER

TOWN OF REDWATER
ALBERTA

WATERWORKS SYSTEM

DRAWN T. J. T.
CHECKED Rd
DESIGN
1" = 1200'
APPROVED BY
JOB No. 3164 - 001
DATE MAY 1, 1967
DWG No. 3164-WM-67-2



NOTE

WELL SITES EASEMENTS ETC
APPROX LOCATION ONLY DATA
SECURED FROM LANDTITLES ETC DEC 966

2 CONTOURS ARE APPROX ONLY
AND NOT TO BE USED FOR
FINAL DESIGN

REVISIONS
DATE BY SUBJECT

ASSOCIATED ENGINEERING SERVICES LTD
Consulting Engineers
REGINA EDMONTON VANCOUVER

TOWN OF REDWATER
ALBERTA

SEWERAGE SYSTEM

DRAWN T.J.T. CHECKED RK DESIGN
SCALES APPROVED BY JOB No 3164 00
1" = 1200' DATE MAY 1, 1967.
DWG No 3164-SM-67-3

FINANCIAL STATEMENT

Town of Redwater - December 31st, 1966

(1) Population - 1041 (1966 Dominion Census)

(2) Assessment

Land	$ 180,330.00
Buildings & Improvements	1,107,023.00
Electric Light & Power	21,730.00
Pipe Line	49,630.00
TOTAL ASSESSMENT	$1,358,713.00

(3) Taxes Levied, Collected and Receivable

Arrears at Dec. 31, 1965	80,339.54
1966 Tax Levy	116,539.02
1966 Tax Collections	108,117.38
1966 Discounts	3,863.25
Arrears at Dec. 31, 1966	88,244.28

NOTE: The arrears o/s are very high for so young a town and well above normal average.

(4) Debenture Debt at December 31, 1966

	Town at Large	Owner's Share	Total
Water supply and distribution	78,958.71	28,086.99	105,045.70
Sewers	11,547.51	23,467.74	35,015.25
Sidewalks	182,919.85	-	189,419.85
Office & Fire Hall	6,500.00	-	
TOTALS	$279,926.07	$49,554.73	$329,480.80

(5) Borrowing Power

(a) Total net assessment		$ 1,358,713.00
(b) Borrowing power (20%)		271,174.00
Total debenture debt,	$329,480.80	
deduct water debt,) and sewer debt)	140,060.95	
Balance chargeable	189,419.85	189,419.85
Balance of general borrowing power available		$ 81,755.00
Debenture debt per capita at December 31, 1966		$ 317.00

Possible borrowing (based on maximum of $500.00 per capita for all purposes)

$183.00 or $190,500.00.

EXPLANATORY NOTE:

The Town and Village Act (Section 421) limits borrowing for general purposes, excluding water and sewer debt, to 20% of the net live assessment (see (5) above). This would allow the Town to borrow up to $81,755.00 for general purposes such as land acquisition, buildings, etc. The Local Authorities Board has an established, practical borrowing limit for all purposes at $500.00 per capita although this is not necessarily an entirely inflexible limit. However assuming these limits to prevail, Redwater has the following borrowing ability:

(1) For general purposes (excluding water and sewer)	$81,775.00
(2) For water and sewer	$109,245.00
TOTAL TO BRING LIMIT UP TO $500.00 per capita	$191,020.00

SYNOPSIS

1. The fertilizer manufacturing complex is a definite proposal to be completed by Spring, 1969 and upon which preliminary clearing has already been completed.
2. The number of employees required for the complex is 350. They and their families will have to be housed in the vicinity of the plant. Coupled with this the employees and their families will require adequate facilities - shops, schools, recreational areas.
3. Of the settlements within easy travelling distance, Bruderheim, Gibbons, Fort Saskatchewan and Redwater, the first two, because of their limited facilities can be discounted, the choice resting between the Towns of Fort Saskatchewan and Redwater.
4. An assessment of the relative merits of these two towns shows that
   - (a) The Town of Redwater is close to the proposed fertilizer plant, can provide a greater number of housing plots, fully serviced at a slightly cheaper rate than those at Fort Saskatchewan.
   - (b) The housing plots can be made immediately available within the Town boundary of Redwater, whereas the Town of Fort Saskatchewan could provide some plots in 1968 only by acquiring additional land outside that Town's boundaries.
   - (c) In the interest of the Region's development, the Town of Redwater which has been experiencing a gradual decline in population, needs a boost to its economy.

5. The Town of Redwater has made a formal request for New Town status and even without a substantial increase in population the Town will be involved in considerable expenditure to reinstate its out-worn sewer and water systems. The attainment of New Town status would assist in relieving to some extent the financial burden, but much more so if this were coupled with an increase in population.

6. One additional factor which must be taken into account is the question of additional water supplies and the recently conducted regional study. An additional source of water must be found and this will involve substantial capital funds. The ultimate benefits however, cannot be gainsayed, with the provision of better facilities and the opening up of the area.

TOWN OF REDWATER
OFFICE OF SECRETARY-TREASURER
REDWATER ALBERTA

May 11th, 1967

The Minister,
Department of Municipal Affairs,
Edmonton, Alberta.

Dear Sir:

At the last meeting of the Council of the Town of Redwater held on May 9th, 1967 a motion was passed that the Council make application for a New Town Status.

This motion was passed after giving serious consideration to the present financial condition of the Town and the necessary expension of the utilities. These will become necessary because of the proposed Industrial Developments in the area.

The reasons of the Council for making this application are as follows:

1. Land acquisation
2. Development of a sub-division
3. Construction of a new Town Hall
4. Extensions of water and sewer mains
5. Increase of water suppy
6. New Sewer Lagoon
7. Maintenance Equipment
8. Building and hard surfacing approximately three miles of road.

I enclose herewith a copy on Water and Sewer Study for the Town of Redwater

Trusting this application will receive your favourable consideration.

Yours truly,

S. Antoniuk,
Secretary-Treasurer.

RECEIVED
MAY 15 1967
[illegible] office of
[illegible] of
[illegible] of
[illegible] AFFAIRS

TOWN OF REDWATER
OFFICE OF SECRETARY-TREASURER
REDWATER ALBERTA

May 17, 1967

The Minister
Department of Municipal Affairs
Edmonton, Alberta

Dear Sir:

With reference to my letter of May 11th, 1967 making application for a New Town Status, I regret to say that I omitted to state that the Council of the Town of Redwater would like the New Town Status Board to consist of seven members.

I regret for making the above omission.

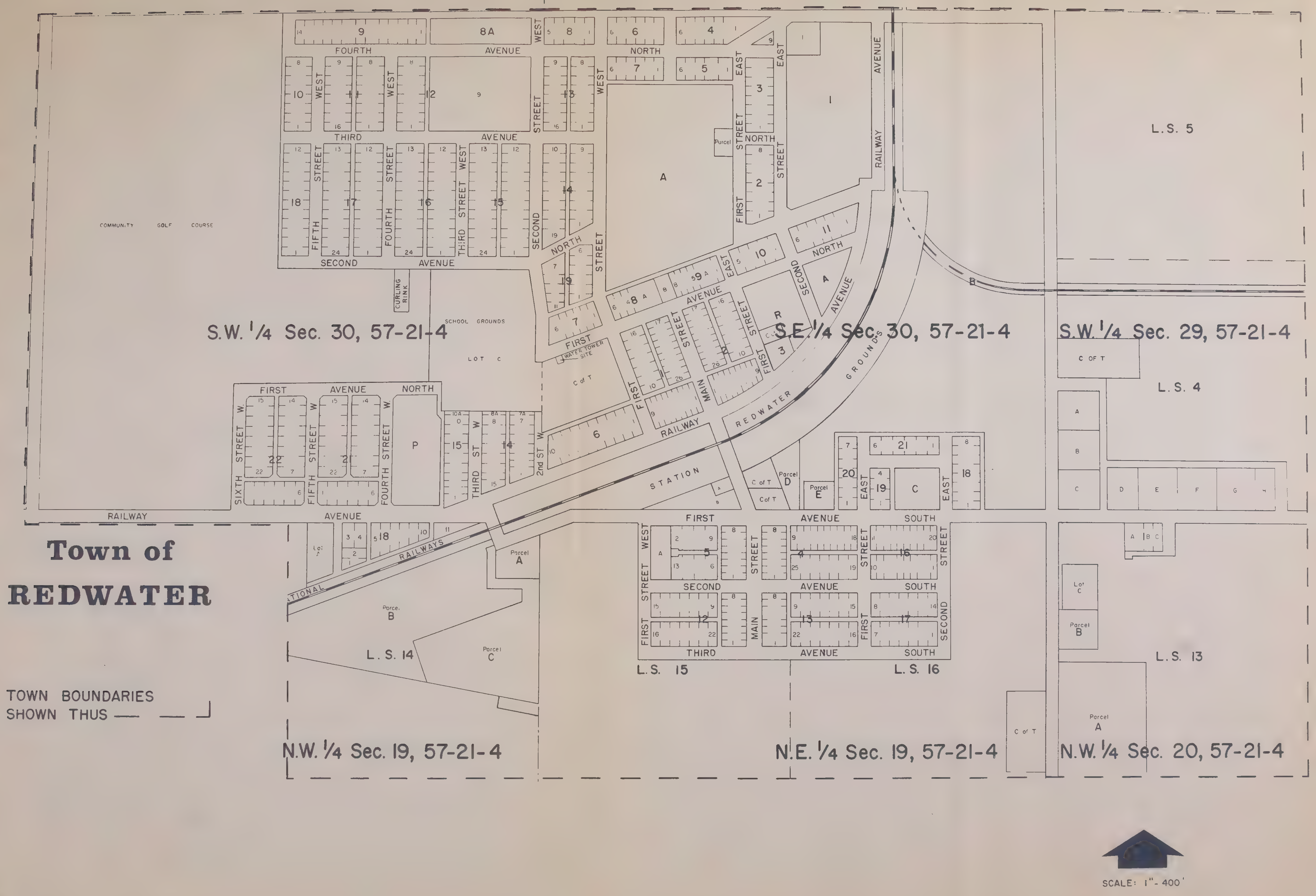
Yours truly,

..............Sec.-Treasurer
S. Antoniuk
Town of Redwater

SA/mc

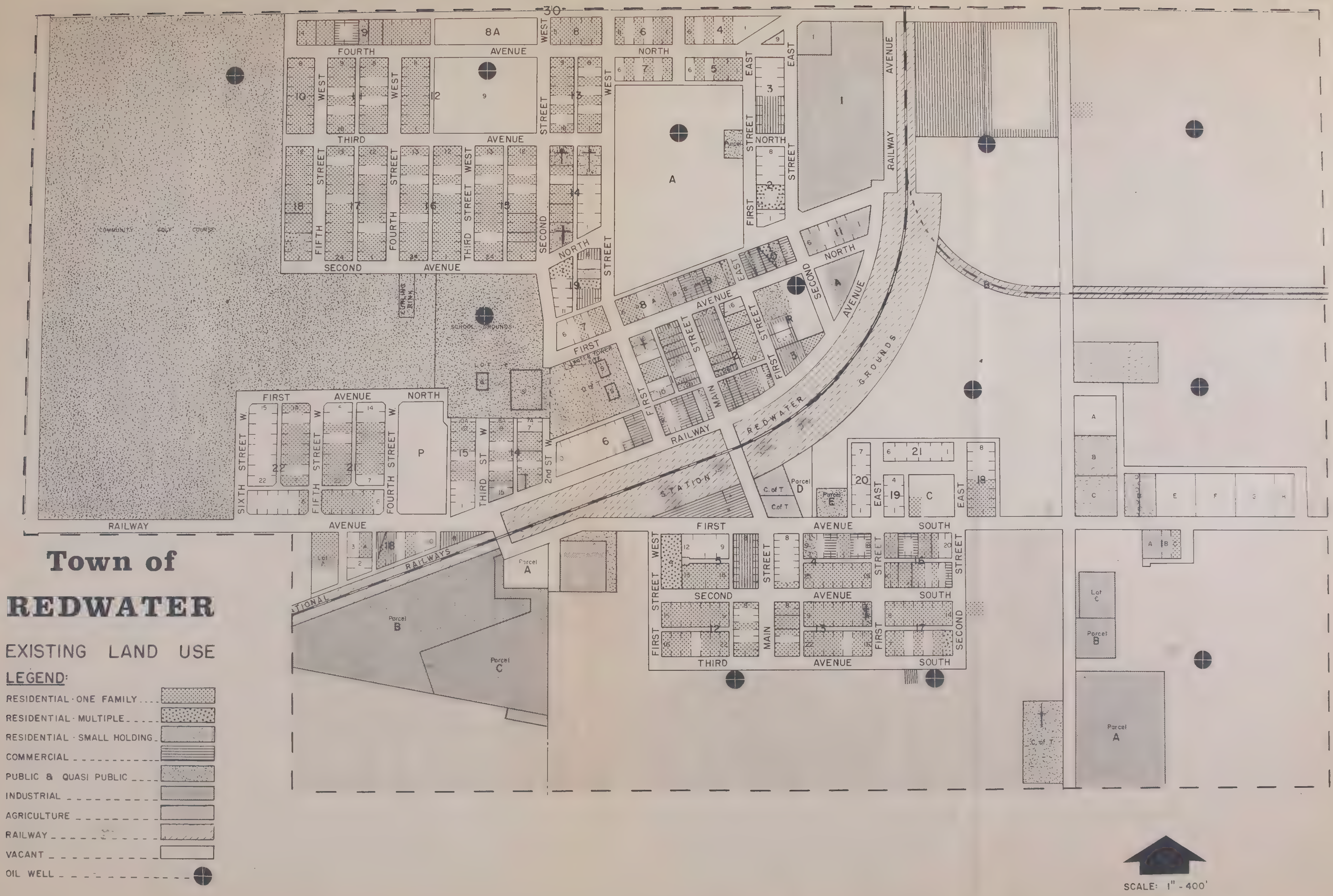
RECEIVED
MAY 18 1967
[illegible]

Fig. 3



Town of REDWATER

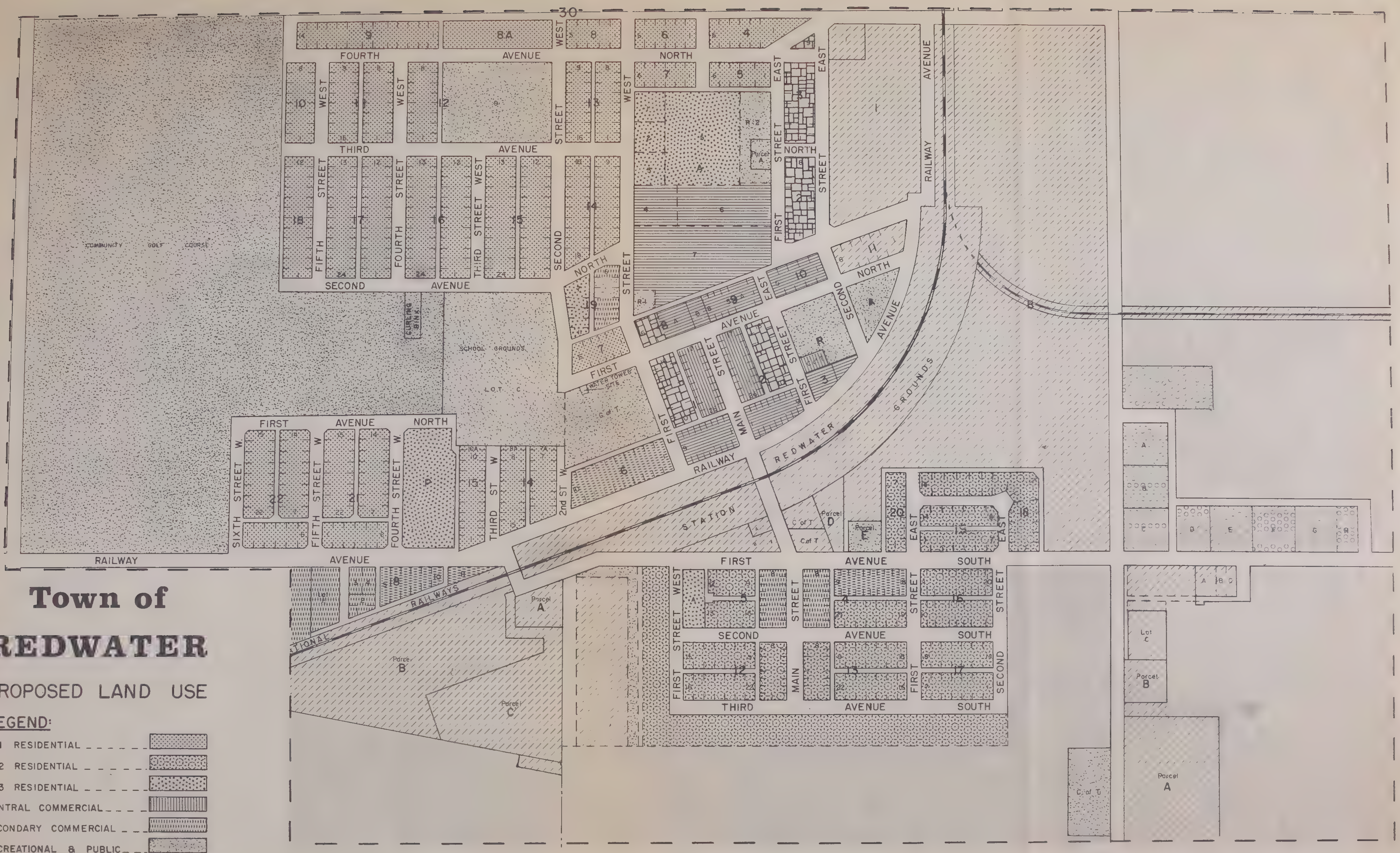
Fig. 4



Town of REDWATER

EXISTING LAND USE

Fig. 5



Town of

REDWATER

PROPOSED LAND USE

LEGEND:

R-1 RESIDENTIAL	░
R-2 RESIDENTIAL	░
R-3 RESIDENTIAL	░
CENTRAL COMMERCIAL	▥
SECONDARY COMMERCIAL	▤
RECREATIONAL & PUBLIC	░
INDUSTRIAL	▨
AGRICULTURAL SMALLHOLDING	░
AGRICULTURAL	☐
TRANSITIONAL	▦

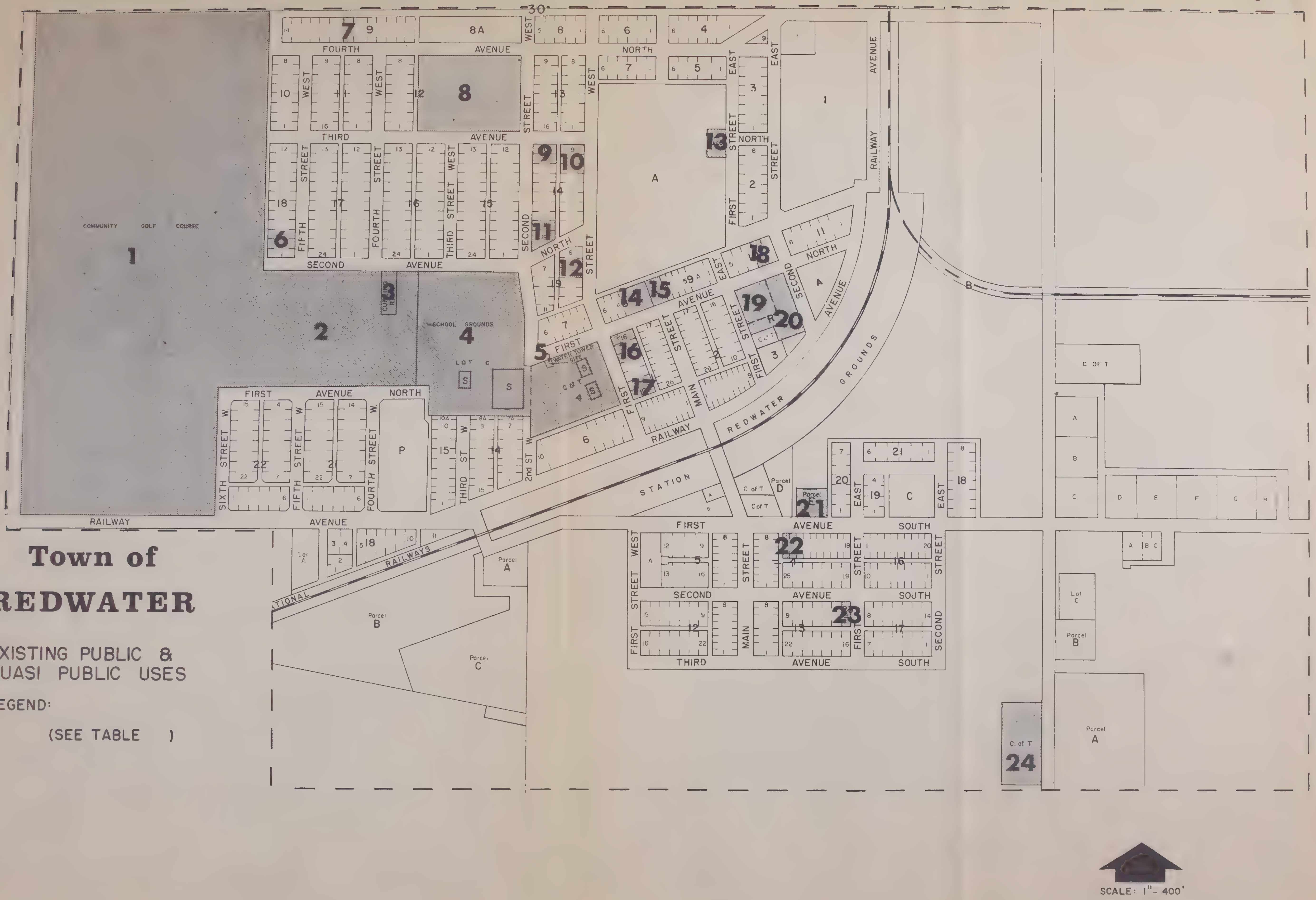
SCALE: 1" - 400'

TABLE 2

PUBLIC AND QUASI-PUBLIC USES

1. COMMUNITY GOLF COURSE AND CLUB HOUSE (9 hole)
2. SPORTS GROUND (2 ice rinks and baseball diamond)
3. CURLING RINK (4 sheets)
4. SCHOOL PLANT (Grades 1 to 12)
5. TOWN WATER TOWER
6. R.C.M.P.
7. PRIVATE SWIMMING POOL
8. PROPOSED CENTENNIAL PARK AND PLAYGROUND
9. ANGLICAN CHURCH
10. UKRAINIAN CATHOLIC CHURCH
11. UNITED CHURCH
12. TOWN LIBRARY
13. TOWN RESERVOIR AND PUMP HOUSE
14. POST OFFICE
15. TOWN OFFICE
16. ROMAN CATHOLIC CHURCH
17. UKRAINIAN NATIONAL HALL
18. ROYAL CANADIAN LEGION HALL
19. ROYAL CANADIAN LEGION CENOTAPH
20. TOWN PARK RESERVE (undeveloped)
21. LION'S CLUB PLAYGROUND
22. UKRAINIAN GREEK ORTHODOX HALL
23. UNITED MISSION CHURCH
24. UKRAINIAN GREEK ORTHODOX CHURCH AND CEMETERY

Fig. 6



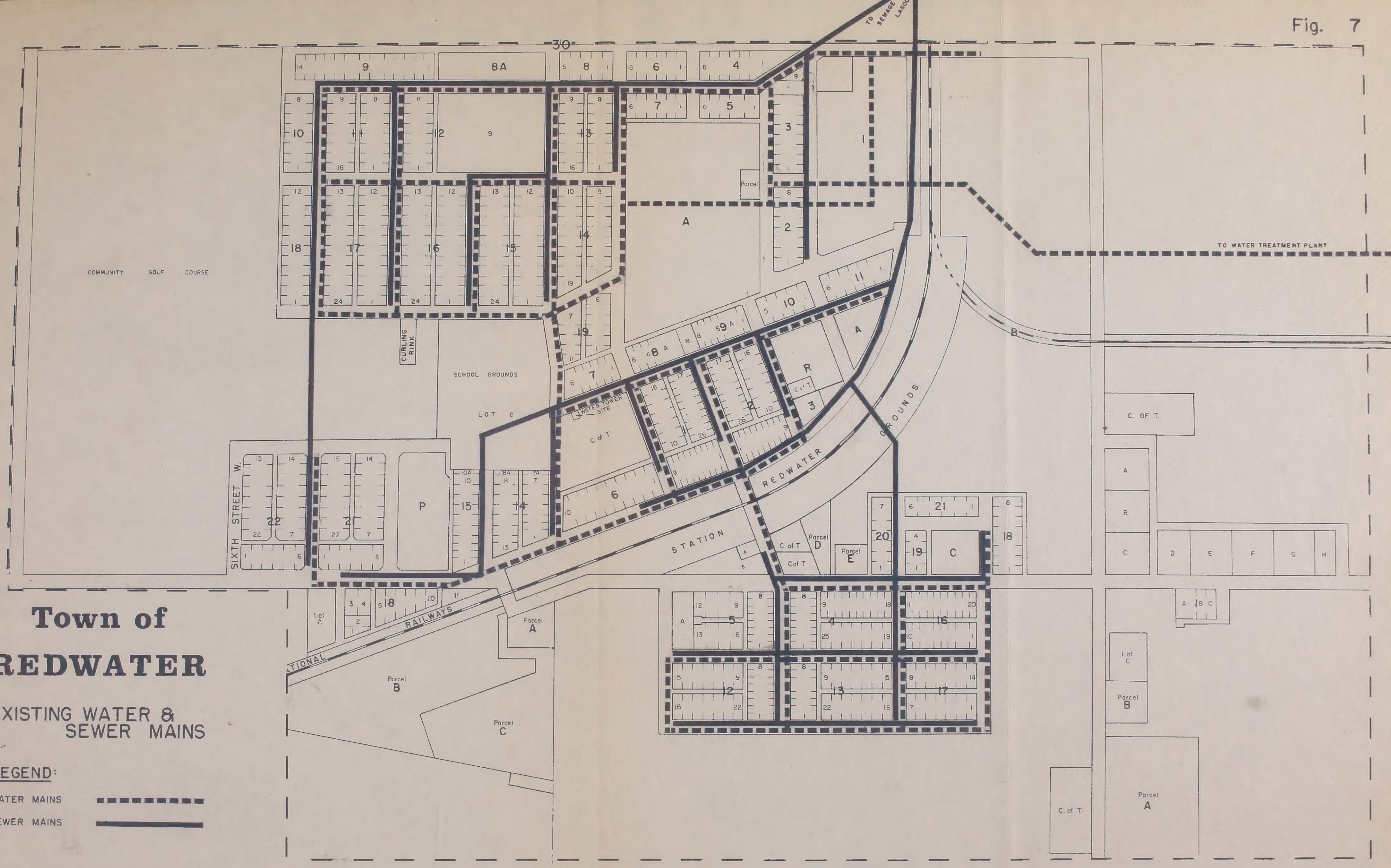
Town of
REDWATER

EXISTING PUBLIC &
QUASI PUBLIC USES

LEGEND:

(SEE TABLE)

Fig. 7



Town of
REDWATER

EXISTING WATER & SEWER MAINS

LEGEND:

WATER MAINS ▬ ▬ ▬ ▬

SEWER MAINS ▬▬▬▬

SCALE: 1"- 400'